

REMARKS

Pursuant to the non-final Office Action mailed June 5, 2006, which has been carefully considered, Applicants respectfully request reconsideration. To further the prosecution of this application, each of the issues raised in the non-final Office Action is addressed herein.

As Claims 11-33 have been withdrawn from consideration, Claim 2 has been cancelled, and Claims 34-38 are newly presented, Claims 1, 3-10 and 34-38 are currently pending in this application. The subject matter of cancelled Claim 2 has been incorporated into Claims 1 and 34. In addition, Claim 1 has been amended to address the Examiner's objection and to further clarify that which Applicants regard as the invention. Further, Claims 34-38 have been added to more clearly define the computer-readable medium carrying the sequence of instructions that performs the steps of the present invention. Support for these Amendments are found generally within the specification, claims, and drawings, as originally filed. Specifically, support for amendments concerning obtaining an improved approximation of true mean DGD are provided at page 15, paragraphs [0053] - [0054] of the specification.

These amendments were not made to limit the scope of the present invention nor were they made to distinguish the present invention from the art of record. No new matter was added to the specification, drawings or claims, as amended.

A. Objections to the Drawings

The drawings were objected to due to omission of the legend "Prior Art". Accordingly, replacement sheets of drawings have been submitted, which designate Figures 1, 3 and 4 as "Prior Art". Therefore, it is respectfully submitted that the objections to the drawings have been obviated.

B. Objections to the Claims

Accordingly, page 14 of the specification has been amended to correct the informality. Claims 1-10 were objected to due to an informality. Therefore, it is respectfully submitted that the objections to Claims 1-10 have been obviated.

C. Claim Rejections under 35 U.S.C. §101

In the Office Action, Claims 1-10 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.

The present invention relates to a method for increasing the accuracy of measurements in an optical fiber system including a measurement of a true mean differential group delay of at least one length of optical fiber. The method includes measuring a mean square differential group delay averaged over a finite bandwidth of a source using a polarization mode dispersion measurement apparatus, calculating an approximation of the true mean differential group delay, and applying a systematic correction factor to the approximation to calculate the true mean differential group delay. The application of the correction factor minimizes a systematic error caused by the finite bandwidth of a source, as now defined by amended Claim 1.

It is understood that to meet the requirements of 35 U.S.C. §101 “(t)he claimed invention as a whole must accomplish a practical application. That is, it must produce a useful, concrete and tangible result.” As noted above, Claim 1, as amended, clearly recites a method for increasing the accuracy of measurements in an optical fiber system. In particular, Claim 1 is directed to improving the accuracy of measurements of the true mean differential group delay, which has significant importance in the telecommunications industry. As discussed throughout the specification and specifically at page 3, paragraph [0008], polarization mode dispersion (PMD) is recognized as a potentially limiting impairment for high-speed long-haul optical transmission. It is currently widely accepted in the field of fiber optics that knowledge of the true mean differential group delay permits estimation through

probabilities of possible system outage times. Such knowledge can prevent both false positive and false negative estimates that can waste valuable resources and delay response times for service. With current commercial fiber optic systems having a spectrum of no more than 100nm, a measured mean DGD value of 0.2ps (which corresponds to a 100km link of a $0.02 \text{ ps/km}^{1/2}$ fiber) approximates the true value with as much as 100% error. In practical terms, more precise measurement of the true mean differential group delay of individual fiber links and whole fiber routes can substantially improve service. Additionally, Claim 1 requires transformation of the measurement of a mean square differential group delay using polarization mode dispersion measurement apparatus into a true mean differential delay. This transformation provides a useful, concrete and tangible outcome that improves service in optical networks.

Therefore, it is respectfully requested that the rejection of Claim 1 under 35 U.S.C. § 101 be reconsidered and withdrawn.

D. Claim Rejections under 35 U.S.C. §103

In the Office Action, Claim 1 was rejected under 35 U.S.C. §103(a) as being obvious over Applicants' Admitted Prior Art (AAPA) in view of U.S. Patent No. 6,867,918 to Damask (*Damask*). Additionally, Claims 4-10 were rejected under 35 U.S.C. §103(a) as being obvious in view of the combined teachings of the AAPA, *Damask* and U.S. Patent No. 6,734,955 to Wight et al. (*Wight*).

The Office Action indicates that the AAPA does not disclose calculating a square differential group delay by using a polarization mode dispersion measurement apparatus. Additionally, nothing in the AAPA would teach or suggest the application of a systematic correction factor ϵ after calculating an approximation for the true mean differential group delay, as required by Claim 1.

It is submitted that *Damask* is directed to a method and apparatus for generating polarization mode dispersion (PMD), not measuring a true mean differential group delay. Thus, the teachings of *Damask* are directly contrary to those of the subject invention. Specifically, high-speed long-haul optical transmissions do not benefit from increased PMD, which can limit transmissions. Thus, there would be no motivation to combine such disparate teachings. Also, in view of Claim 1, as amended, the combined teachings of *Damask* and the AAPA do not teach or suggest each of the elements of Claim 1. Additionally, while *Wight* is directed to dispersion measurements in optical networks, it does not disclose or suggest the elements as required by Claim 1. In particular, neither *Damask* nor *Wight* discloses performing any calculations after measuring a differential group delay. Also, neither *Damask* nor *Wight* teaches nor suggests calculating an approximation of a mean square differential group delay or the further application of a systematic correction factor for minimizing errors caused by the finite bandwidth of a source.

Applicants respectfully note that in order to support a claim of *prima facie* obviousness, the cited references must teach or suggest each and every element of the invention, and there must be a motivation in the references or the prior art to combine the references and the prior art as suggested. However, nothing in the art of record or the AAPA would teach or suggest, either alone or in combination, a method for increasing the accuracy of measurements in an optical fiber system including a measurement of a true mean differential group delay in a length of optical fiber, as now defined by amended Claim 1.

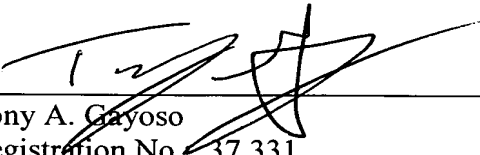
Applicants respectfully submit that Claims 3-10, which ultimately depend from Claim 1, are patentable over the art of record by virtue of their dependence. Further, Applicants submit that Claims 3-10 define additional patentable subject matter in their own right. Therefore, it is respectfully requested that the rejection of Claims 1 and 4-10 under 35 U.S.C. §103 be reconsidered and withdrawn.

Applicants: Boroditsky, et al.
Application Serial No.: 10/747,804
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C. Conclusion

Entry of the amendments to Claim 1, favorable consideration of Claim 1, as amended; and allowance of pending Claims 1 and 3-10 are solicited. In view of the foregoing amendment and remarks, this application should now be in condition for allowance. A Notice to this effect is respectfully requested. If the Examiner believes that a telephone interview would assist in moving the application toward allowance, he is respectfully invited to contact the Applicants' attorney at the telephone number listed below.

Respectfully submitted,



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IN THE DRAWINGS:

Replacement sheets for Figures 1, 3, and 4 are submitted herewith, in which the legend --Prior Art-- has been added.